

description below. Other features, objects, and advantages will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033] The accompanying drawings, which are incorporated into and constitute a part of this specification, illustrate one or more embodiments of the present disclosure and, together with the detailed description, serve to explain the principles and implementations of the disclosure.

[0034] FIG. 1 shows a schematic representation of the method to manufacture a reversed or inversed phase barcoded array according to an embodiment herein disclosed. Panel A shows a barcode pattern including a number of stripes or bars corresponding to immobilized serum molecules from various patients. Panel B shows a barcode pattern wherein the bars are provided by microfluidic channels formed on top of the array of Panel A.

[0035] FIG. 2 shows a schematic representation of a method and equipment to detect a barcoded array according to an embodiment herein disclosed.

[0036] FIG. 3 shows a schematic representation of a comparative detection of a spot array and of a barcoded array according to an embodiment herein disclosed.

[0037] FIG. 4 shows a schematic representation of an exemplary passage in the patterning methods and systems for producing a barcoded array according to an embodiment herein disclosed.

[0038] FIG. 5 shows a schematic representation of the method to manufacture a patterned substrate, using a multi-layer fluidic channel device according to an embodiment herein disclosed.

[0039] FIG. 6 shows an exemplary array according to an embodiment herein disclosed.

[0040] FIG. 7 shows two images corresponding to an exemplary molecular detection using a 20 μm barcoded array (panel A) and a 2 μm barcoded array (panel B) according to an embodiment herein disclosed.

[0041] FIG. 8 shows a computer-aided design of the barcode array according to an embodiment herein disclosed and a related use. The panel on the bottom shows thirteen different capture agents (A-M) flowed into a set of parallel fluidic channels each channel having a width of 20 μm . The top panel is the enlarged view of a selected area.

[0042] FIG. 9 shows the execution of multiple assays in twelve isolated wells using a barcoded array according to an embodiment herein disclosed. Panel A shows a barcoded array manufactured on a supporting glass slide. Panel B shows protein detection from the array of Panel A visualized by fluorescence imaging.

[0043] FIG. 10 shows a schematic representation of the method to detect target molecules using a group of distinct capture agents that are directly patterned into a barcoded array according to an embodiment herein disclosed.

[0044] FIG. 11 shows a schematic representation of the method to detect target molecules using a group of distinct capture agents that are immobilized onto the specific location of a pre-determined barcoded array via a set of linkers according to an embodiment herein disclosed. This is exemplified by the detection of target antigen using captured antibodies encoded by a set of complementary DNA molecules.

[0045] FIG. 12 shows a schematic representation of the method to vary the loading of capture agents and conse-

quently the sensitivity and concentration range for the detection of targets using a barcoded array according to an embodiment herein disclosed.

[0046] FIG. 13 shows a schematic representation of a method to manufacture a device including a barcoded array according to an embodiment herein disclosed and a related use.

[0047] FIG. 14 shows an exemplary detection of protein targets according to an embodiment herein disclosed.

[0048] FIG. 15 shows an exemplary protein detection using a barcoded array according to an embodiment herein disclosed and comparison with the protein detection using a conventional pin-spotted array.

[0049] FIG. 16 shows an exemplary detection of target polynucleotides according to an embodiment herein disclosed.

[0050] FIG. 17 shows an exemplary multiplexed detection of multiple protein targets in a sample using a barcoded array according to an embodiment herein disclosed.

[0051] FIG. 18 shows an exemplary detection of a protein target according to an embodiment herein disclosed.

[0052] FIG. 19 shows an exemplary detection of multiple targets in a sample using a barcoded array according to an embodiment herein disclosed, and its comparison to the conventional array.

[0053] FIG. 20 shows a schematic representation of a method and system to detect targets according to an embodiment herein disclosed.

[0054] FIG. 21 shows an exemplary detection of a target in a series of samples according to an embodiment herein disclosed.

[0055] FIG. 22 an exemplary detection of a protein target in a series of samples over a large concentration range according to an embodiment herein disclosed.

[0056] FIG. 23 shows an exemplary detection of a biological profile according to an embodiment herein disclosed.

[0057] FIG. 24 shows an exemplary detection of a target at different concentration ranges according to an embodiment herein disclosed.

[0058] FIG. 25 shows data concerning the exemplary detection of a biological profile of FIG. 20A.

[0059] FIG. 26 shows detection of a protein profiling in a time span according to an embodiment herein disclosed.

[0060] FIG. 27 shows an exemplary quantitative detection according to an embodiment herein disclosed.

[0061] FIG. 28 shows an exemplary elaboration of biological profiles detected according to the exemplary embodiment illustrated in FIG. 21(A) embodiment herein disclosed.

[0062] FIG. 29 shows an exemplary detection of target proteins in a drop of fresh human blood.

[0063] FIG. 30 shows an exemplary detection of a human plasma proteome according to an embodiment herein disclosed.

[0064] FIG. 31 shows a schematic representation of the method to manufacture a patterned substrate according to an embodiment herein disclosed.

DETAILED DESCRIPTION

[0065] Arrays, substrates, devices, methods and systems for detecting a target, and in particular, a plurality of target molecules in a sample are herein disclosed.

[0066] The term “detect” or “detection” as used herein indicates the determination of the existence, presence or fact of a target or signal in a limited portion of space, including but